

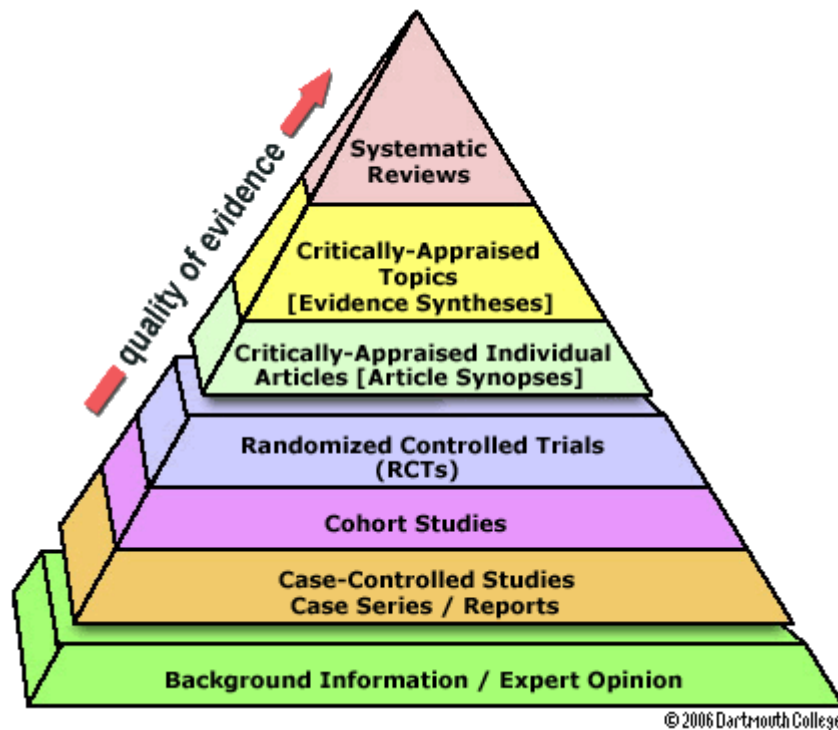
Critical appraisal tools

“Relax, it’s much worse than you think”

– Hunt, E. (1996)

Michael Crowe

Background



- Problems
 - Variety of sources
 - Not comprehensive
 - Incomplete scoring
 - Lack validity & reliability

A critical review

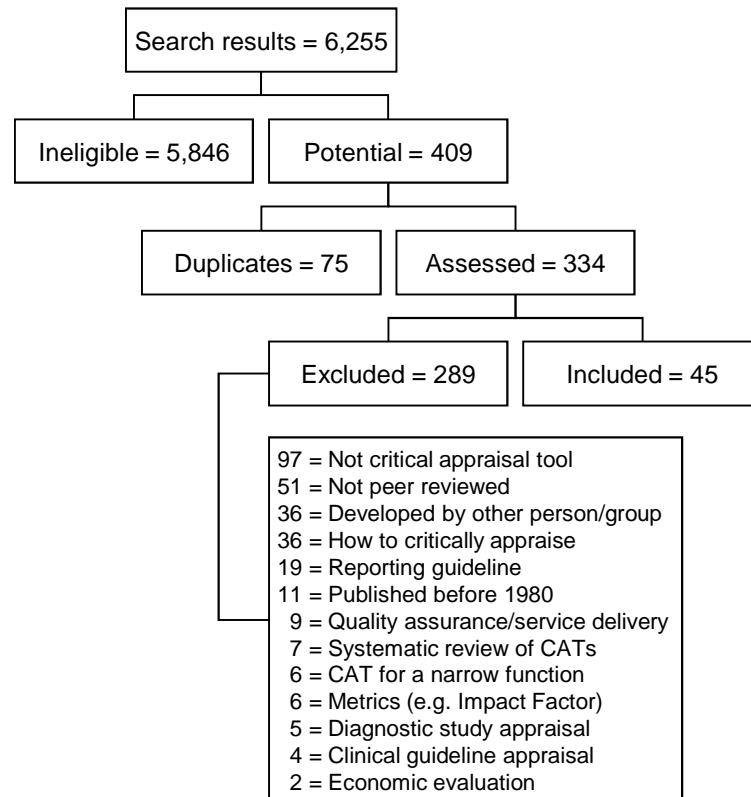
- Focus

- Design
- Evaluation
- Peer reviewed

- Methods

- Critical review
 - Inclusion criteria
 - Exclusion criteria
 - Search strategy
 - Ethics
-

Results – Quantitative



- Research design
 - General: 24 (53%)
 - All designs: 6 (13%)
 - All quantitative: 5 (11%)
 - All experimental: 4 (9%)
 - All qualitative: 9 (20%)
 - Specific: 19 (42%)
 - True experimental: 11 (24%)
 - Various: 8 (18%)
 - Not stated: 7 (16%)

Results – Quantitative (cont.)

- Design strategy
 - Expert or group: 42 (93%)
 - Literature: 3 (7%)
 - Explanation
 - Comprehensive: 5 (11%)
 - Some: 23 (51%)
 - None: 17 (38%)
 - Validity
 - Some: 3 (7%)
 - Little or none: 42 (93%)
 - Reliability
 - Some: 10 (22%)
 - Little or none: 35 (78%)
 - Validity & reliability?
-

Conclusion – Quantitative

- Ignore basic research and testing methods
 - Be careful what critical appraisal tool you use
 - Questions to ask
 - What research designs?
 - Compare research designs?
 - Validity and reliability data?
-

Results – Qualitative

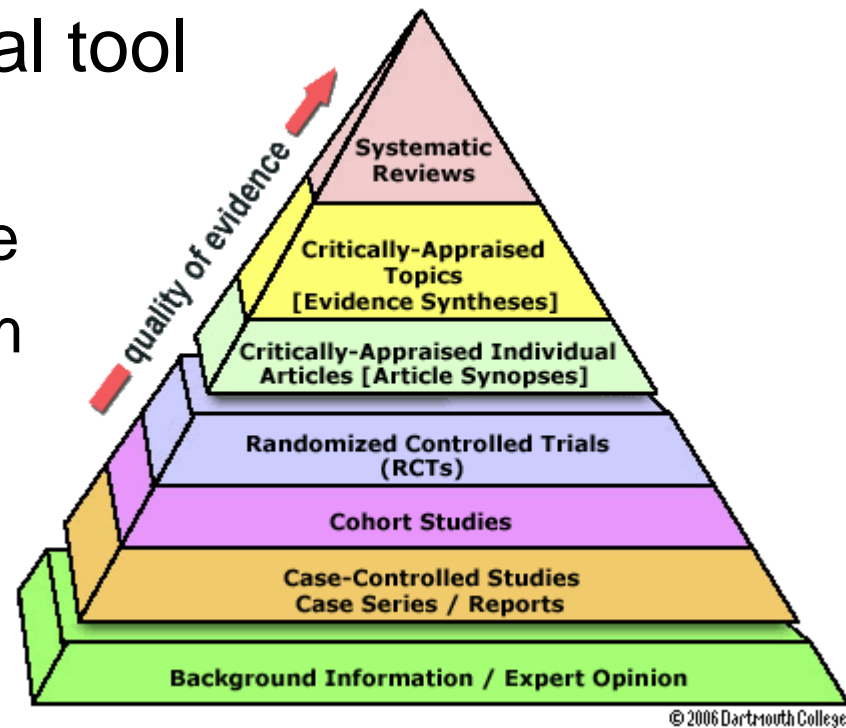
- Preliminaries
 - Text (2)
 - Title (1)
 - Abstract (2)
 - Introduction
 - Background (2)
 - Objective (2)
 - Research design
 - Design type (2)
 - Intervention, input, exposure (3)
 - Outcome, output, predictor (3)
 - Bias and other (4)
 - Sampling
 - Sampling method (2)
 - Sample size (2)
 - Sampling protocol (3)
-

Results – Qualitative (cont.)

- Ethical matters
 - Participant (2)
 - Researcher (2)
 - Data collection
 - Collection method (2)
 - Collection protocol (3)
 - Results
 - Analysis, integration, interpretation method (3)
 - Essential analysis (3)
 - Outcome, output, predictor analysis (3)
 - Discussion
 - Interpret (4)
 - Generalise (2)
 - Concluding remarks (3)
-

Conclusion – Qualitative

- Develop a critical appraisal tool
 - Health research
 - Qualitative and quantitative
 - Appropriate scoring system
 - Validity and reliability



Crowe Critical Appraisal Tool



Category Item	Item descriptors [<input checked="" type="checkbox"/> Present; <input type="checkbox"/> Absent; <input type="checkbox"/> Not applicable]
1. Preliminaries	
Title	1. Includes study aims <input type="checkbox"/> and design <input type="checkbox"/>
Abstract (assess last)	1. Key information <input type="checkbox"/> 2. Balanced <input type="checkbox"/> and informative <input type="checkbox"/>
Text (assess last)	1. Sufficient detail others could reproduce <input type="checkbox"/> 2. Clear/concise writing <input type="checkbox"/> , table(s) <input type="checkbox"/> , diagram(s) <input type="checkbox"/> , figure(s) <input type="checkbox"/>

2. Introduction	
Background	1. Summary of current knowledge <input type="checkbox"/> 2. Specific problem(s) addressed <input type="checkbox"/> and reason(s) for addressing <input type="checkbox"/>
Objective	1. Primary objective(s), hypothesis(es), or aim(s) <input type="checkbox"/> 2. Secondary question(s) <input type="checkbox"/>

Is it worth continuing?

3. Design	
Research design	1. Research design(s) chosen <input type="checkbox"/> and why <input type="checkbox"/> 2. Suitability of research design(s) <input type="checkbox"/>
Intervention, Treatment, Exposure	1. Intervention(s)/treatment(s)/exposure(s) chosen <input type="checkbox"/> and why <input type="checkbox"/> 2. Precise details of the intervention(s)/treatment(s)/exposure(s) <input type="checkbox"/> for each group <input type="checkbox"/> 3. Intervention(s)/treatment(s)/exposure(s) valid <input type="checkbox"/> and reliable <input type="checkbox"/>
Outcome, Output, Predictor, Measure	1. Outcome(s)/output(s)/predictor(s)/measure(s) chosen <input type="checkbox"/> and why <input type="checkbox"/> 2. Clearly define outcome(s)/output(s)/predictor(s)/measure(s) <input type="checkbox"/> 3. Outcome(s)/output(s)/predictor(s)/measure(s) valid <input type="checkbox"/> and reliable <input type="checkbox"/>
Bias, etc	1. Potential bias <input type="checkbox"/> , confounding variables <input type="checkbox"/> , effect modifiers <input type="checkbox"/> , interactions <input type="checkbox"/> 2. Sequence generation <input type="checkbox"/> , group allocation <input type="checkbox"/> , group balance <input type="checkbox"/> , and by whom <input type="checkbox"/> 3. Equivalent treatment of participants/cases/groups <input type="checkbox"/>

Is it worth continuing?

4. Sampling	
Sampling method	1. Sampling method(s) chosen <input type="checkbox"/> and why <input type="checkbox"/> 2. Suitability of sampling method <input type="checkbox"/>
Sample size	1. Sample size <input type="checkbox"/> , how chosen <input type="checkbox"/> , and why <input type="checkbox"/> 2. Suitability of sample size <input type="checkbox"/>
Sampling protocol	1. Target/actual/sample population(s): description <input type="checkbox"/> and suitability <input type="checkbox"/> 2. Participants/cases/groups: inclusion <input type="checkbox"/> and exclusion <input type="checkbox"/> criteria 3. Recruitment of participants/cases/groups <input type="checkbox"/>

Is it worth continuing?

5. Data collection	
Collection method	1. Collection method(s) chosen <input type="checkbox"/> and why <input type="checkbox"/> 2. Suitability of collection method(s) <input type="checkbox"/>
Collection protocol	1. Include date(s) <input type="checkbox"/> , location(s) <input type="checkbox"/> , setting(s) <input type="checkbox"/> , personnel <input type="checkbox"/> , materials <input type="checkbox"/> , processes <input type="checkbox"/> 2. Method(s) to ensure/enhance quality of measurement/instrumentation <input type="checkbox"/> 3. Manage non-participation <input type="checkbox"/> , withdrawal <input type="checkbox"/> , incomplete/lost data <input type="checkbox"/>

Is it worth continuing?

6. Ethical matters	
Participant ethics	1. Informed consent <input type="checkbox"/> , equity <input type="checkbox"/> 2. Privacy <input type="checkbox"/> , confidentiality/anonymity <input type="checkbox"/>
Researcher ethics	1. Ethical approval <input type="checkbox"/> , funding <input type="checkbox"/> , conflict(s) of interest <input type="checkbox"/> 2. Subjectivities <input type="checkbox"/> , relationship(s) with participants/cases <input type="checkbox"/>

Is it worth continuing?

7. Results	
Analysis, Integration, Interpretation method	1. A.I.I. method(s) for primary outcome(s)/output(s)/predictor(s) chosen <input type="checkbox"/> and why <input type="checkbox"/> 2. Additional A.I.I. methods (e.g. subgroup analysis) chosen <input type="checkbox"/> and why <input type="checkbox"/> 3. Suitability of analysis/integration/interpretation method(s) <input type="checkbox"/>
Essential analysis	1. Flow of participants/cases/groups through each stage of research <input type="checkbox"/> 2. Demographic and other characteristics of participants/cases/groups <input type="checkbox"/> 3. Analyse raw data <input type="checkbox"/> , response rate <input type="checkbox"/> , non-participation/withdrawal/incomplete/lost data <input type="checkbox"/>
Outcome, Output, Predictor analysis	1. Summary of results <input type="checkbox"/> and precision <input type="checkbox"/> for each outcome/output/predictor/measure 2. Consideration of benefits/harms <input type="checkbox"/> , unexpected results <input type="checkbox"/> , problems/failures <input type="checkbox"/> 3. Description of outlying data (e.g. diverse cases, adverse effects, minor themes) <input type="checkbox"/>

8. Discussion	
Interpretation	1. Interpretation of results in the context of current evidence <input type="checkbox"/> and objectives <input type="checkbox"/> 2. Draw inferences consistent with the strength of the data <input type="checkbox"/> 3. Consideration of alternative explanations for observed results <input type="checkbox"/> 4. Account for bias <input type="checkbox"/> , confounding/effect modifiers/interactions/imprecision <input type="checkbox"/>
Generalisation	1. Consideration of overall practical usefulness of the study <input type="checkbox"/> 2. Description of generalisability (external validity) of the study <input type="checkbox"/>
Concluding remarks	1. Highlight study's particular strengths <input type="checkbox"/> 2. Suggest steps that may improve future results (e.g. limitations) <input type="checkbox"/> 3. Suggest further studies <input type="checkbox"/>

9. Total	
Total score	1. Add all scores for categories 1–8

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